

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Original) A non-naturally occurring recombinant DNA molecule comprising a sequence encoding a chelon protein which binds mercuric ions.

---

2. (Currently amended) The non-naturally occurring recombinant DNA molecule of claim 1 wherein the sequence encodes a chelon protein having the amino acid sequence given in amino acids 1 to 107 of SEQ ID NO:4.  
*B4*

---

3. (Original) The non-naturally occurring recombinant DNA molecule of claim 1 wherein the sequence encodes a chelon protein which binds cadmium as well as mercuric ion.

---

4. (Currently amended) The non-naturally occurring recombinant DNA molecule of claim 3 having wherein the chelon protein comprises an amino acid sequence selected from the group consisting of amino acids 1 to 107 of SEQ ID NO:4, amino acids 1 to 107 of SEQ ID NO:5, amino acids 1 to 107 of SEQ ID NO:6, amino acids 1 to 107 of SEQ ID NO:7, amino acids 1 to 107 of SEQ ID NO:8, amino acids 1 to 107 of SEQ ID NO:9; amino acids 1 to 107 of SEQ ID NO:10; amino acids 1 to 107 of SEQ ID NO:11; and amino acids 1 to 107 of SEQ ID NO:12.  
*B5*

---

5. (Original) A host cell transformed or transfected to contain the recombinant DNA molecule of claim 1.

---

6. (Original) A host cell transformed or transfected to contain the recombinant DNA molecule of claim 3.

- B4*
7. (Currently amended) The transformed or transfected host cell of claim 6, wherein the chelon protein which is ~~encodes~~ has comprises the amino sequence given in amino acids 1 to 107 of SEQ ID NO:4.
  8. (Currently amended) The transformed or transfected host cell of claim 6, wherein the chelon protein which is encoded ~~has~~ comprises the amino sequence selected from the group consisting of SEQ ID NO:4; amino acids 1 to 107 of SEQ ID NO:5, amino acids 1 to 107 of SEQ ID NO:6, amino acids 1 to 107 of SEQ ID NO:7, amino acids 1 to 107 of SEQ ID NO:8, amino acids 1 to 107 of SEQ ID NO:9; amino acids 1 to 107 of SEQ ID NO:10; amino acids 1 to 107 of SEQ ID NO:11; and amino acids 1 to 107 of SEQ ID NO:12.
  9. (Currently amended) A method for recombinantly producing a chelon protein in a host cell, said method comprising the steps of:
    - a) infecting or transforming a host cell capable of expressing a chelon coding sequence with a vector comprising a promoter active in said host cell operably linked to a coding region for said chelon ~~having~~ comprising an amino acid sequence as selected from the group consisting amino acids 1 to 107 of SEQ ID NO:4, amino acids 1 to 107 of SEQ ID NO:5, amino acids 1 to 107 of SEQ ID NO:6, amino acids 1 to 107 of SEQ ID NO:7, amino acids 1 to 107 of SEQ ID NO:8, amino acids 1 to 107 of SEQ ID NO:9; amino acids 1 to 107 of SEQ ID NO:10; amino acids 1 to 107 of SEQ ID NO:11; and amino acids 1 to 107 of SEQ ID NO:12 to produce a recombinant host cell; and
    - b) culturing the recombinant host cell under conditions wherein said chelon is expressed.

- 37
10. (Currently amended) A method for removing divalent mercury, divalent cadmium, cobalt, copper, lead, nickel or zinc cations from a source comprising divalent mercury or cadmium said cations, said methods comprising the step of contacting the source with a MerR or chelon protein, whereby the MerR or chelon protein binds the divalent mercury, divalent cadmium, cobalt, copper, lead, nickel or zinc cations.
- 38
11. (Currently amended) The method of claim 10 wherein the chelon protein has an amino acid sequence selected from the group consisting of amino acids 1 to 107 of SEQ ID NO:4, amino acids 1 to 107 of SEQ ID NO:5, amino acids 1 to 107 of SEQ ID NO:6, amino acids 1 to 107 of SEQ ID NO:7, amino acids 1 to 107 of SEQ ID NO:8, amino acids 1 to 107 of SEQ ID NO:9; amino acids 1 to 107 of SEQ ID NO:10; amino acids 1 to 107 of SEQ ID NO:11; and amino acids 1 to 107 of SEQ ID NO:12.
12. (Original) The method of claim 10 wherein the MerR or chelon protein is bound to a solid substrate and the source is an aqueous material.
13. (Original) The method of claim 10 wherein the MerR or chelon protein is expressed in a transgenic plant cell, transgenic plant tissue or transgenic plant.
- 39
14. (Currently amended) The method of claim 13 wherein the chelon has an amino acid sequence selected from the group consisting of amino acids 1 to 107 of SEQ ID NO:4, amino acids 1 to 107 of SEQ ID NO:5, amino acids 1 to 107 of SEQ ID NO:6, amino acids 1 to 107 of SEQ ID NO:7, amino acids 1 to 107 of SEQ ID NO:8, amino acids 1 to 107 of SEQ ID NO:9; amino acids 1 to 107 of SEQ ID NO:10; amino acids 1 to 107 of SEQ ID NO:11; and amino acids 1 to 107 of SEQ ID NO:12.

- B1b**
- 
15. (New) A chelon protein having an amino acid sequence selected from the group consisting of amino acids 1 to 107 of SEQ ID NO:4 , amino acids 1 to 107 of SEQ ID NO:5, amino acids 1 to 107 of SEQ ID NO:6, amino acids 1 to 107 of SEQ ID NO:7, amino acids 1 to 107 of SEQ ID NO:8, amino acids 1 to 107 of SEQ ID NO:9, amino acids 1 to 107 of SEQ ID NO:10, amino acids 1 to 107 of SEQ ID NO:11 and amino acids 1 to 107 of SEQ ID NO:12.
  16. (New) The method of claim 12 wherein the chelon protein is bound to a solid support.
-